

STATE OF NORTH CAROLINA
COUNTY OF WAKE
NORTH CAROLINA LEAGUE OF
CONSERVATION VOTERS, INC., *et al.*,

Plaintiffs,

COMMON CAUSE,

Plaintiff-Intervenor,

v.

REPRESENTATIVE DESTIN HALL, in his official
capacity as Chair of the House Standing Committee
on Redistricting, *et al.*,

Defendants.

IN THE GENERAL COURT OF JUSTICE
SUPERIOR COURT DIVISION
No. 21 CVS 015426

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COUNTY OF WAKE

REBECCA HARPER, *et al.*,

Plaintiffs,

v.

REPRESENTATIVE DESTIN HALL, in his official
capacity as Chair of the House Standing Committee
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Defendants.

IN THE GENERAL COURT OF JUSTICE
SUPERIOR COURT DIVISION
No. 21 CVS 500085

**HARPER PLAINTIFFS' SUBMISSION REGARDING
PROPOSED REMEDIAL PLANS FOR COURT REVIEW**

Pursuant to this Court’s February 8, 2022 Order regarding the submission of remedial maps and its February 17 Order appointing special masters, *Harper* Plaintiffs respectfully submit this statement regarding the proposed remedial districting plans they are submitting to the Court today for North Carolina’s congressional districts and the state Senate.

Because the General Assembly has enacted a remedial state House plan on a bipartisan basis, *Harper* Plaintiffs are not submitting any alternative remedial House plan for the Court’s review. But *Harper* Plaintiffs are submitting proposed maps for Congress and the state Senate because—unlike the General Assembly’s enacted remedial House map—the congressional and Senate maps enacted yesterday were forced through the General Assembly by Republicans, were passed on strict-party line votes. The General Assembly’s remedial congressional and Senate maps are partisan gerrymanders that flout the Supreme Court’s decisions in this case. *Harper* Plaintiffs will explain these maps’ deficiencies more fully in their responsive submission due February 21. But, in short, the newly enacted congressional and Senate maps do not come close to meeting the partisan fairness and other key metrics identified by the Supreme Court, and those maps repeat key features that this Court and the Supreme Court found reflected partisan intent and effect, including the General Assembly’s new congressional map once again divides the cities of the Piedmont Triad into three separate districts to dilute the voting power of Democratic voters there, with ripple effects throughout the map.

The following describes the process of creating *Harper* Plaintiffs’ proposed remedial congressional and Senate plans, and provides key data and information about those plans, including the data and information specified in this Court’s February 8 and February 17 Orders.

I. Proposed Remedial Congressional Plan

Harper Plaintiffs' proposed remedial congressional plan is a plan filed by Senator Jay Chaudhuri as Senate Bill 738 on October 28, 2021, during the initial 2021 redistricting process.¹ Senator Chaudhuri drew this plan at a public terminal during the legislative map-drawing process that eventually led to enactment of the now-invalidated plans. *Harper* Plaintiffs submit this plan as it was publicly filed, without alteration.

Harper Plaintiffs have submitted by email block equivalency files for this proposed remedial plan in .CSV format, as well as ESRI shapefiles, for each district and for the plan as a whole. Attached hereto as exhibits are the following documents associated with this plan:

- Color versions of the statewide map and all districts in .PDF format (Exhibit A).
The statewide map is the official version filed publicly as part of Senate Bill 738 and available on the General Assembly's website. The individual district maps were produced using this statewide map.
- The official StatPack Report available on the General Assembly's website, which demonstrates the proposed plan's adherence to traditional non-partisan districting criteria, including population deviation, county splits, and incumbency (Exhibit B). As shown in Exhibit B, the proposed plan does not pair any incumbents expected to run for Congress in 2022.
- The official Compactness Report available on the General Assembly's website, further demonstrating the proposed plan's adherence to traditional non-partisan districting criteria (Exhibit C).

¹ See <https://www.ncleg.gov/BillLookup/2021/S738>.

Harper Plaintiffs evaluated this proposed remedial plan using three measures of partisan fairness: the mean-median difference, the efficiency gap, and a partisan symmetry metric described below. *See Harper v. Hall*, No. 413PA21, Order ¶ 6 (N.C. Feb. 4, 2022). Each of these metrics was calculated using the results of 16 recent statewide elections: 2016 Attorney General, 2016 Governor, 2016 Lieutenant Governor, 2016 Presidential, 2016 U.S. Senate, 2020 State Auditor, 2020 Attorney General, 2020 Commissioner of Agriculture, 2020 Commissioner of Insurance, 2020 Commissioner of Labor, 2020 Governor, 2020 Lieutenant Governor, 2020 Presidential, 2020 Secretary of State, 2020 Treasurer, and 2020 U.S. Senate.

Using this set of statewide elections, the partisan symmetry of *Harper* Plaintiffs' proposed remedial congressional plan is **0.36875 seats**, which, as explained further below, reflects the average deviation in seats won between the parties given a particular vote share. This score reflects an exceptionally high degree of partisan symmetry. By way of comparison, only 62 of Dr. Mattingly's 80,000 simulated congressional plans both accounted for incumbency and had a partisan symmetry score of less than 0.36875 seats.

In measuring partisan symmetry, *Harper* Plaintiffs' overriding goal was to ensure, as the Supreme Court directed, that "voters of all political parties" have "substantially equal opportunity to translate votes into seats across the plan." *Harper* Order ¶ 6. As the Supreme Court explained, "voters are entitled to have substantially the same opportunity to electing a supermajority or majority of representatives as the voters of the opposing party would be afforded if they comprised" a given percentage "of the statewide vote share in that same election." *Harper v. Hall*, No. 413PA21, slip op. ¶ 169 (N.C. Feb. 14, 2022). To implement this directive, *Harper* Plaintiffs' expert Dr. Jonathan Mattingly and his colleague Dr. Gregory Herschlag (the Phillip Griffiths Assistant Research Professor of Mathematics at Duke

University) measured partisan symmetry using a metric that uses *symmetric, reciprocal pairs* of Democratic vote shares across a range of recent, statewide elections and calculates how those two symmetric vote shares would translate into seats elected for that party in Congress.

To take an example: Dr. Mattingly and Dr. Herschlag began with the results of the 2016 Governor election and applied a “uniform swing” to the election results to reflect a 48% Democratic statewide vote share for that election. They calculated how many Republican representatives would be elected with that 48% Democratic vote share. They then applied a uniform swing to that election so that it reflected the corresponding, reciprocal Democratic vote share—*i.e.*, 52%. They then computed the number of *Democratic* representatives that would be elected with that 52% Democratic vote share. They then calculated the *absolute difference* between the number of Republican representatives elected with 48% Democratic vote share and the number of Democratic representatives elected with a 52% Democratic vote share. Thus, if 8 Republicans were elected with 48% Democratic vote share, and 7 Democrats were elected with 52% vote share, the absolute difference would be *1 seat*. (Because the figure is absolute, the value is always positive. It does not reflect which party benefits from the asymmetry; it captures only the *degree* of asymmetry.) Dr. Mattingly and Dr. Herschlag repeated that process using several sets of reciprocal vote fractions—45% and 55%, 46% and 54%, 47% and 53%, and 49% and 51%. They did this for each of the 16 statewide elections listed above, and then calculated an *average* of the absolute difference between the number of Republican seats elected (under the lower Democratic vote share) and the number of Democratic seats elected (under the higher Democratic vote share).

The metric thus captures the *average, absolute deviation*, across elections and across vote shares, between the number of seats that the two parties are expected to elect at the same given

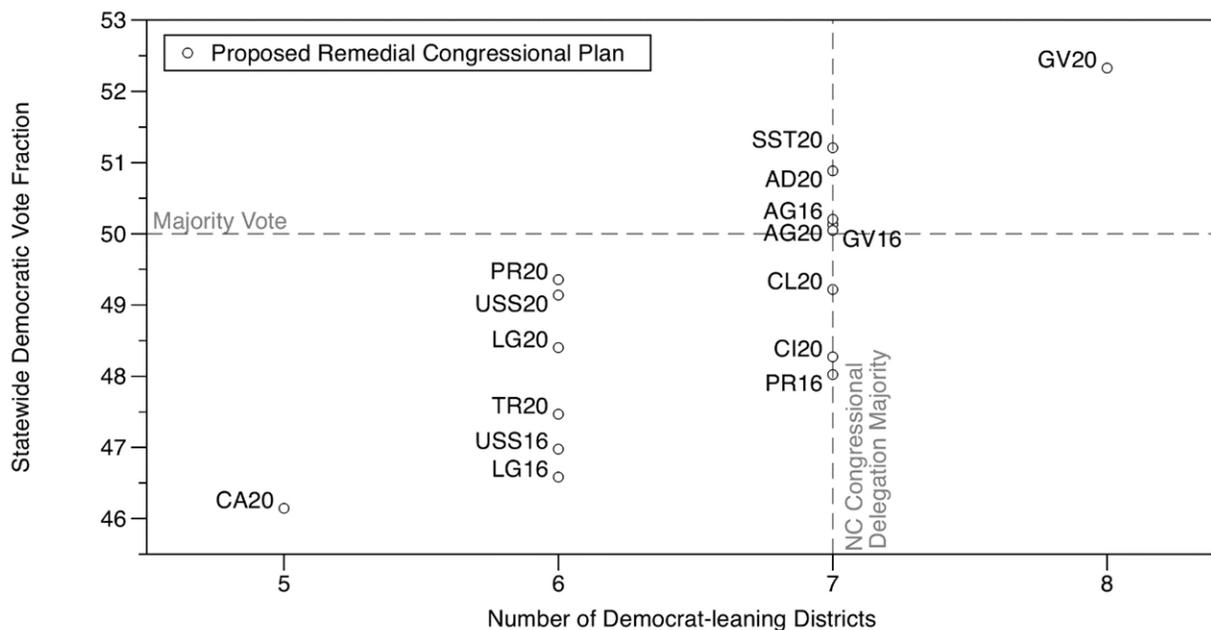
vote share. *Lower* numbers reflect *greater* partisan symmetry, and in particular, reflect a more “equal opportunity to electing a supermajority or majority of representatives as the voters of the opposing party would be afforded if they comprised” a given percentage “of the statewide vote share in that same election.” *Harper* slip op. ¶ 169. As mentioned, the partisan symmetry metric for this proposed congressional plan is a deviation of 0.36875 seats. In practical terms, this means that for any given statewide election, the number of Democratic and Republican seats elected at a given party vote fraction will more often than not be the same number; and the expected difference averaged across a range of 16 statewide elections is only 0.36875 seats. As noted above, this is an exceptionally high degree of partisan symmetry.

As to other partisan fairness metrics identified in the Supreme Court’s order and opinion: The average mean-median difference for this proposed map is **0.4504%**. The average efficiency gap using historical election results, without applying any uniform swing to these results, is **2.6676%**. The average efficiency gap calculated by conducting uniform swings on these election results, ranging from 45% to 55% Democratic vote share, is **2.7180%**.

The plot below illustrates this plan’s extraordinary partisan fairness. IT shows the expected number of Democratic seats using the results of the 16 statewide elections listed above. For example, under the 2020 Lieutenant Governor race, which had a 48.4% Democratic vote share, Democrats would be expected to win 6 seats and Republicans would be expected to win 8 seats under the proposed map. In generally symmetric fashion, under the Governor 2020 race, which had a 52.32% Democratic vote share, Democrats would be expected to win 8 seats and Republicans would be expected to win 6 seats. Further demonstrating the symmetry of the plan, in elections where Republicans get 50% of the vote or more, they win 7 or 8 seats (or 9, in the election where they won 54% of the vote); similarly, in elections where Democrats get 50% of

the vote or more, they win 7 seats (or 8, in the election where they got 52.5% of the vote). In short, this is the partisan symmetry the Supreme Court directed.

Harper Plaintiffs’ proposed plan is dramatically superior to the now-invalidated 2021 enacted Congressional plan on the metrics that the Supreme Court identified. The 2021 enacted congressional plan, using Dr. Mattingly and Dr. Herschlag’s partisan symmetry metric, had a partisan symmetry score of 5.50625—meaning the average seat deviation between the parties given the same vote share was 15 times as high as it is in *Harper* plaintiffs’ proposed remedial plan. This reflects that, under the enacted plan, Republicans win 10 seats when they get 51% of the vote, while Democrats win 4 seats when they get 51% of the vote—a highly asymmetric deviation of six seats. The 2021 enacted Congressional plan had a mean-median gap of 5.49%, and an enormous average efficiency gap of 18.267% (using historical election results) or 19.813% (by conducting uniform swing on those results). The proposed plan is also superior to the 2022 remedial congressional plan enacted by the General Assembly on party-line votes, as *Harper* Plaintiffs will detail in their February 21 filing.



II. Proposed Remedial Senate Plan

Harper Plaintiffs' proposed remedial Senate plan began with a base map selected from an ensemble generated by Dr. Jonathan Mattingly's computer algorithm, with a small number of adjustments aimed to (1) unpair incumbents where possible and (2) improve compactness.

The initial base map was selected from Dr. Mattingly's ensemble of simulations as follows: Dr. Mattingly began with a full ensemble of approximately 80,000 computer-generated Senate plans. Dr. Mattingly created this ensemble in connection with his academic work, prior to being retained as an expert in this case. All of the simulated plans in the ensemble follow traditional redistricting criteria that the Supreme Court described, including improving compactness and limiting the number of county splits. This ensemble did not seek to minimize municipality splits, which was not one of the criteria that the Supreme Court identified as potentially justifying deviations from partisan symmetry. *See Harper* Order ¶ 8 (listing compactness, equal population, preserving counties, and contiguity). The algorithm also did not restrict the county groupings to those used in the now-invalidated 2021 enacted Senate plan. Rather, the computer-generated plans in the ensemble could use any county groupings that comply with the Whole County Rule and *Stephenson*.

Dr. Mattingly and Dr. Herschlag then filtered this full ensemble of plans using metrics of partisan fairness, to ensure that any plan ultimately selected from the ensemble would strictly comply with the Supreme Court's directives. They used two filtering mechanisms: the first referred to as the "majority vote, majority seats" ratio, and the second being the same "partisan symmetry" metric described above in the context of the proposed congressional plan. For each map, the "majority vote, majority seats" ratio was calculated for each party as follows: Dr. Mattingly and Dr. Herschlag began with the results of the recent, statewide elections listed

above; counted the number of those elections where Democrats won the majority of the *seats* under that map; and divided that number by the number of elections where Democrats won a majority of the *vote*. That division produces a ratio representing the proportion of elections in which, when Democrats won a majority of the vote, they also won a majority of seats. For example, a Democratic “majority votes, majority seats” ratio of 0.75 would mean that, in 75% of the elections where the Democrats won a majority of the votes, Democrats won a majority of seats in the Senate. They then calculated the corresponding ratio for the Republicans.

Dr. Mattingly and Dr. Herschlag filtered the plans in the ensemble to require a “majority votes, majority seats” ratio exceeding 0.99 for both parties—*i.e.*, a plan was filtered out unless the party winning a majority of votes won a majority of seats over 99% of the time. Plans also were filtered to require a partisan symmetry score (as described above) of less than 0.85 seats.

This filtering process yielded a small subset of 15 potential Senate plans—less than 0.02% of the approximately 80,000 in the full ensemble. Among this subset, the base map chosen scored among the two best across each of the partisan fairness metrics and in terms of compactness. As noted, the ensemble from which this map was selected was not restricted to the county groupings used by the General Assembly in the now-invalidated 2021 enacted Senate plan. The base map varied from that now-invalidated map in three of the four clusters where there was a choice of county groupings under the Whole County Rule and *Stephenson*—specifically, for the Northeastern county clusters and the clusters containing Forsyth County and Buncombe County.

A small number of changes were then made to the base map exclusively for two purposes: to unpair all incumbents who can be unpaired consistent with the map’s county-cluster boundaries, and to improve the map’s compactness. In addition to *Harper* Plaintiffs’ counsel, the

other individuals who participated in making the changes were John Holden, a GIS expert who served as *Harper* Plaintiffs' consulting expert during the merits phase of this case, and, with respect to certain changes, *Harper* Plaintiffs' testifying expert Dr. Christopher Cooper.

In particular, changes were made within four county groupings where it was possible to unpair incumbents: (1) Alamance-Anson-Cabarrus-Montgomery-Randolph-Richmond-Union; (2) Forsyth-Yadkin; (3) Iredell-Mecklenburg; (4) Guilford-Rockingham. Further changes were made in the Granville-Wake grouping to equalize population, given that Dr. Mattingly's ensemble did not permit splitting VTDs and splitting VTDs is necessary to get to 5% deviation in this cluster. Other changes were made to improve compactness in the Cumberland-Moore and Durham-Chatham county groupings. The proposed plan ultimately pairs incumbents in four clusters, all of which are unavoidable under the Whole County Rule: Alamance-Anson-Cabarrus-Montgomery-Randolph-Richmond-Union; Catawba-Cherokee; Carteret-Chowan; and Hoke-Scotland-Robeson. (The Alamance cluster had previously paired three incumbents under the base map.)

In making changes to the base map, conscious choices were made to avoid any changes that would alter the partisan makeup, with one exception: in the Guilford-Rockingham county grouping, the base map created three Democratic-leaning districts. The changes necessary to unpair Senator Berger and Senator Robinson replaced one of those Democratic-leaning districts with a competitive-to-Republican-leaning district. In other words, the only change to the base map that had partisan effects favored the Republican Party.

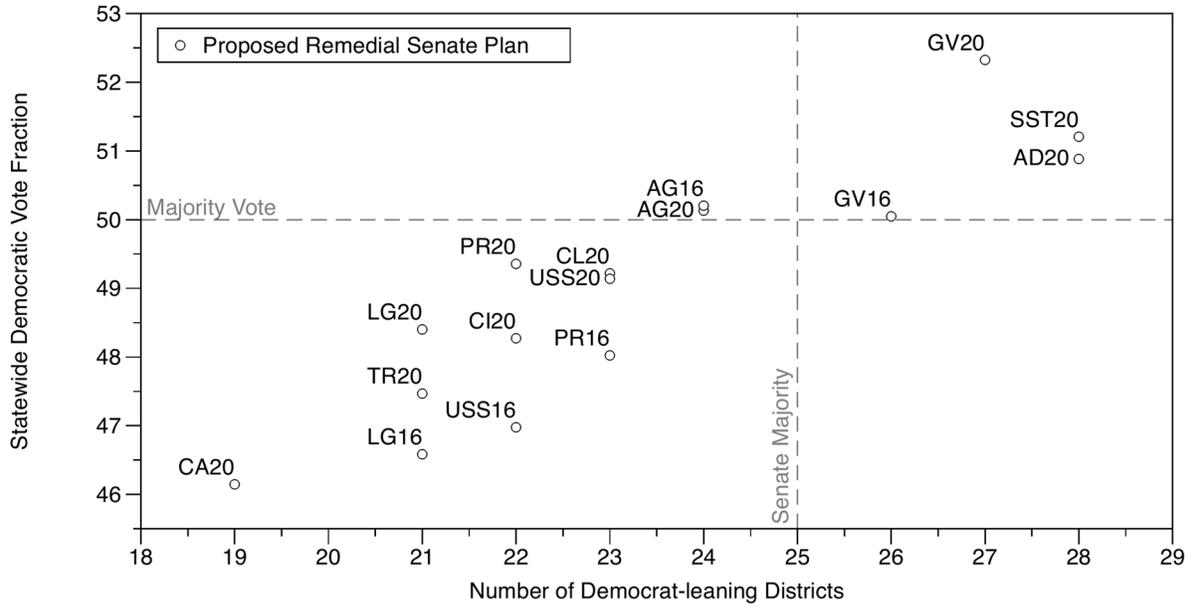
Harper Plaintiffs have submitted by email block equivalency files for this proposed plan in CSV format, as well as ESRI shapefiles, for each district and for the plan as a whole. *Harper* Plaintiffs also have attached as exhibits color versions of the statewide map (Exhibit D) and

maps of each county grouping (Exhibit E) in PDF format.² *Harper* Plaintiffs are also submitting spreadsheets identifying county splits and listing the population and population deviation in each district in the proposed plan. These spreadsheets confirm that the plan complies with the Whole County Rule and the equal population requirements. The average Reock score for the proposed plan is 0.414627, and the average Polsby-Popper score is 0.349573.

Harper Plaintiffs have also evaluated this proposed plan using the same measures of partisan fairness described above in the context of their proposed congressional plan: mean-median difference, efficiency gap, and partisan symmetry. *See Harper* Order ¶ 6. Using the same set of statewide elections listed above, the average mean-median difference for this proposed map is **0.2278%**. The average efficiency gap using historical election results, without applying any uniform swing to these results, is **1.9817%**. The average efficiency gap calculated by conducting uniform swings on these election results, ranging from 45% to 55% Democratic vote share, is **1.9551%**.

The partisan symmetry metric—*i.e.*, the average deviation in seats won at a given party vote share—is **1.04375 seats**. That compares to an average seat deviation in the 2021 enacted Senate plan, using the same metric, of 7.54 seats. The plot below, akin to the plot described above for the proposed congressional plan, further illustrates the plan’s partisan fairness, showing the number of Democratic seats elected under the results of 16 recent statewide elections.

² Because *Harper* Plaintiffs did not assert any race-based claims in this litigation, they have not submitted any analysis of whether Section 2 of the Voting Rights Act requires the drawing of a majority-minority district.



The proposed plan is dramatically superior to the 2021 enacted Senate plan on the metrics that the Supreme Court identified. The 2021 enacted senate plan had enormous average seat deviations between the parties when they did the same in statewide elections, an average of over 7 seats. The 2021 enacted senate plan had a mean-median gap of 3.46%, an average efficiency gap of 7.192% (using historical election results) or 7.798% (by conducting uniform swing on those results). The proposed plan is also superior to the 2022 remedial Senate plan enacted by the General Assembly on party-line votes, as *Harper* Plaintiffs will detail in their February 21 filing.

Respectfully submitted, this the 18th day of February, 2022.

By: /s/ Narendra K. Ghosh

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CERTIFICATE OF SERVICE

I hereby certify that I have this day served a copy of the foregoing *by email*, addressed to counsel for all other parties.

This the 18th day of February, 2022.

/s/ Narendra K. Ghosh
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